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U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

WATER SUPPLY OUTLOOK

FOR MONTANA

and
FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS
Collaborating with
MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF
JAN. 1, 1981



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STATEWIDE OUTLOOK

MOUNTAIN SNOWPACK

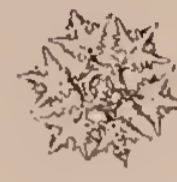
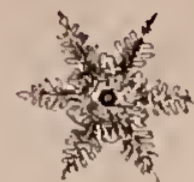
Most areas in Montana have less than 70 percent of average snowpack. Early season snowfall was near normal, but above normal temperatures reduced the low and mid-elevation snowpack so that many low elevation snow courses have no snow. High elevation precipitation has been below average in most areas during December. Presently, the snowpack at higher elevations is better percentagewise than snowpack at lower elevations.

The only areas with near average snowpack are in Glacier National Park, along the Continental Divide west of Helena, on the Bitterroot-Big Hole Divide and in the Yaak River drainage.

Soils are generally not frozen and most of the rain and snowmelt went into the soil causing little runoff except in the Kootenai River drainage.

The lack of snow has already created a significant impact on skiing and other snow-based recreation. If precipitation patterns do not improve substantially during January and February, serious water shortages could develop next spring and summer.

By January 1, about 40 percent of the season's snowpack has usually accumulated on the mountain watersheds.



STREAMFLOW FORECASTS

Runoff during the spring and summer months is forecast to be below average in all areas of the state except for streams near the Canadian border. Most forecasts are in the 70 to 90 percent average range. Well below average runoff is expected in portions of the Beaverhead River drainage, smaller streams near Bozeman and most drainages in central Montana. With more than one-half of the snow accumulation season remaining, significant changes could occur in the next 2 or 3 months. However, if mountain snowfall remains below average, moderate to severe water shortages can be expected next summer.

Moisture stored in the soil under the snowpack is generally near or above average.

SNOW SURVEY DECISION STILL DELAYED

The Soil Conservation Service would like to give you some news about the future direction of the Snow Survey and Water Supply Forecasting Program. But we can't and apologize for the delay.

Last year at our public meetings and in follow-up letters, we told you that a USDA decision on the future direction of the Snow Survey and Water Supply Forecasting program would be made by October 1, 1980, following the publishing of the various alternatives considered about May 1, 1980. Neither deadline has been met.

Based on public meetings and other input, the Soil Conservation Service submitted its recommendations to the Department of Agriculture last spring. The Secretary has not released these SCS recommendations to the public and directed the SCS not to release them.

When any decision is made public, we will pass the information on to our cooperators and to those who provided information through the public participation process.



MONTANA

PROSPECTIVE STREAMFLOW FORECASTS

SCALE IN MILES

Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN STREAM and/or FORECAST POINT	THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD	
	FORECAST		THOUSAND ACRE FEET		FORECAST		THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average
PERIOD	APRIL - SEPTEMBER				APRIL - JULY			
RED ROCK RIVER near Monida (1).....	94.0	85	113	110	88.0	85	102	103
BEAVERHEAD RIVER near Grant (2).....	105	61	193	171	95.0	64	162	148
BEAVERHEAD RIVER at Barratts (2).....	151	67		226	128	65		196
RUBY RIVER near Alder.....	80.0	76		105	66.0	74		89.0
BIG HOLE RIVER near Melrose.....	630	80		792	580	79		730
BOULDER RIVER near Boulder.....	80.0	76	145	103	76.0	78	132	96.7
WILLOW CREEK near Harrison.....	11.6	54		21.5	10.5	55		19.2
MADISON RIVER near Grayling (3).....	425	81	432	523	333	81	328	409
MADISON RIVER near McAllister (4).....	728	82	751	892	583	83	646	706
GALLATIN RIVER near Gallatin Gateway.....	435	76		572	374	77		488
INFLOW MIDDLE CREEK RESERVOIR near Bozeman (5).....	19.4	64		30.3	17.0	65		26.2
HYALITE CREEK near Bozeman (6).....	31.0	65		47.4	26.7	65		41.0
GALLATIN RIVER at Logan.....	380	59		649	330	59		557
MISSOURI RIVER at Toston (7).....	1,990	72	2,743	2,671	1,643	71	2,377	2,330
SHEEP CREEK near White Sulphur Springs.....	16.8	74		22.8	14.5	73		19.8
SUN RIVER at Gibson Dam (8).....	427	74	520	580	390	74	473	529
RELT CREEK near Monarch.....	100	68		146	91.0	68		134
MISSOURI RIVER at Fort Benton (9).....	2,825	68		4,148	2,450	67		3,640
TWO MEDICINE CREEK near Browning (10).....	197	76		259	187	77		244
BADGER CREEK near Browning.....	106	80		133	92.0	79		116
MARIAS RIVER near Shelby.....	425	74	481	577	400	75	444	532
MISSOURI RIVER at Virgelle (11).....	3,275	68		4,793	2,880	68		4,238
MISSOURI RIVER near Landusky (11).....	3,615	69		5,214	3,150	69		4,586
NORTH FORK MUSSELSHELL RIVER near Delpine.....	4.4	69		6.4	3.8	69		5.5
SOUTH FORK MUSSELSHELL RIVER near Martinsdale.....	42.0	68		61.5	39.0	68		57.6
MISSOURI RIVER below Fort Peck Dam (11).....	3,487	71		4,929	3,100	71		4,381
MILK RIVER at Eastern Crossing.....	282*	102		278*				
INFLOW LAKE SAKAKAWA, ND (11).....	9,953	74		13,450	8,950	73		12,239

SASKATCHEWAN RIVER BASIN

SWIFTCURRENT CREEK at Sherburne (12).....	121	92	116	132	106	92	98.5	115
ST. MARY'S RIVER near Babb (12).....	453	91		498	390	92		426

*For the period March - September

1. Adjusted for storage in Lima Reservoir.
2. Adjusted for storage in Lima & Clark Canyon Reservoirs
3. Adjusted for storage in Hebgen Lake.
4. Adjusted for storage in Hebgen Lake & Ennis Lake.
5. Sum West Fork Hyalite Creek & East Fork Hyalite Creek above the reservoir.
6. Adjusted for storage in Middle Creek Reservoir.
7. Adjusted for storage in Lima, Hebgen, Ennis, & Clark Canyon Reservoirs.
8. Adjusted for storage in Gibson Reservoir & diversions.
9. Adjusted for storage in Lima, Clark Canyon, Hebgen, Ennis, Gibson, Pishkun, Willow Creek, & Canyon Ferry.
10. Adjusted for storage in Two Medicine Reservoir & diversions in Two Medicine Canal.
11. Adjusted for all upstream reservoirs.
12. Adjusted for storage in Lake Sherburne.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

STREAMFLOW FORECASTS

Streamflow is forecast to be about 65 to 75 percent of average on most streams in the Missouri River drainage. In the St. Mary's River Basin, runoff is expected to be about 90 percent of average.

Areas where much lower than average runoff is predicted are portions of the Beaverhead River, East Gallatin and Hyalite Creek near Bozeman, Belt Creek and the Judith and Musselshell River drainages. Flow in the Milk River, which is the combined flow of natural runoff and diversion through the St. Mary's Canal, should be near average. Moisture stored in the soil under the snowpack is generally average or above average.

MOUNTAIN SNOWPACK

Almost all mountain watersheds have much less snow than normal with most areas reporting less than 70 percent of average. The worst conditions are in the Gallatin, Teton and Sun River drainages where snowpack is less than one-half of average.

A small area along the Montana-Idaho border east of Monida Pass to the Yellowstone Divide and the Little Belt Mountains has a little better snowpack than most areas but is still below average. The only bright spots with near average amounts of water stored in the

snowpack are along the Continental Divide west of Helena, along the Bitterroot-Big Hole divide and in and near Glacier National Park.

Snowfall began accumulating in the mountains in early October. Since then, mountain precipitation has been below average in most areas. Also, abnormally warm weather has depleted the snowpack in lower elevations and reduced it at mid-elevations.

Most soils are not frozen and have absorbed considerable amounts of snowmelt and rainfall.

SUMMARY of SNOW MEASUREMENTS

RIVER BASIN and/or SUB-WATERSHED	Number of Gauges Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average
Beaverhead	10	126	79
Ruby	2	95	64
Big Hole	8	187	84
Boulder	7	180	80
Jefferson	27	148	79
Madison	12	126	68
Gallatin	11	79	48
Missouri Headwaters	50	121	67
West-side Missouri (Toston-Cascade)	5	154	75
Smith & Belt	3	158	73
Missouri Main-stem	8	157	74
Teton & Sun	2	65	48
Marias	3	115	76
Marias-Teton-Sun	5	101	69
Judith	3	158	73
Musselshell	-	-	-
Judith-Musselshell	3	158	73
Milk	7	60	33
Bear Paws	5	0	0
Missouri (Total)	73	120	67
Saskatchewan			
St. Mary's	2	128	102
80w River in Alberta	-	-	-

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN STREAM and/or FORECAST POINT	THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD	
	FORECAST		THOUSAND ACRE FEET		FORECAST		THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average
PERIOD	April - September				April - July			
YELLOWSTONE RIVER at Corwin Springs.....	1,750	83	1,626	2,102	1,460	83	1,326	1,749
YELLOWSTONE RIVER near Livingston.....	1,970	80		2,471	1,625	79		2,048
BOULDER RIVER at Big Timber.....	330	79		416	310	81		382
STILLWATER near Absarokee (1).....	520	79		660	432	78		555
CLARKS FORK RIVER near Belfry.....	525	82		644	470	83		564
ROCK CREEK near Red Lodge.....	98.0	83	131	118	76.0	83	104	91.4
INFLOW COONEY RESERVOIR near Boyd (2).....	40.0	62		64.5	32.0	61		52.5
YELLOWSTONE RIVER at Billings.....	3,669	78	3,969	4,682	3,107	78	3,377	3,979
BIGHORN RIVER near St. Xavier (3).....	1,603	79	1,611	2,034	1,470	79	1,457	1,861
LITTLE BIGHORN RIVER near Hardin.....	166	85		196	147	84		174
YELLOWSTONE RIVER at Miles City (4).....	5,531	77		7,142	4,750	76		6,243
YELLOWSTONE RIVER near Sidney (5).....	6,018	77		7,806	5,180	76		6,805

1. Adjusted for storage in Mystic Lake.
2. Adjusted for storage in Cooney Reservoir.
3. Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, Pilot Butte & Bighorn Reservoirs.
4. Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, Pilot Butte, Bighorn & Tongue River Reservoirs.
5. Adjusted for reservoirs in 4. and diversions into the Lower Yellowstone Canal.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE.

SUMMARY of SNOW MEASUREMENTS

RIVER BASIN and/or SUB-WATERSHED	Number of Gauges Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average
Upper Yellowstone ab Livingston ..	10	119	64
Shields	2	71	24
Boulder & Stillwater	-	-	-
Rock Creek & Clark's Fork ...	6	100	64
Yellowstone (ab Bighorn River) ..	18	107	59
Bighorn/Wyoming ..	-	-	-
Little Bighorn ..	-	-	-
Bighorn (Total) ..	-	-	-
Tongue	-	-	-
Powder	-	-	-
Yellowstone (Total)	-	-	-

MOUNTAIN SNOWPACK

Most areas have only two-thirds of their normal snowpack. Even less snow is reported in the Bridger and Crazy Mountains and in most low elevation areas.

The area south of Yellowstone Lake has the best snowpack in the drainage, but it is only 70 and 80 percent of average.

Mountain precipitation has generally been below average for the past 2 months. Above normal temperatures have melted most of the low elevation snowpack and reduced it in the mid-elevations.

Most of the snowmelt water and rainfall has soaked into the soils and has improved the soil moisture condition.

STREAMFLOW FORECASTS

Spring and summer runoff is forecast to be between 75 and 85 percent of average on most drainages. These forecasts are somewhat higher than would be expected from the low snowpack. However, soil moisture under the snow is generally near to above average and it is anticipated that the snowfall situation will improve in the next 3 to 4 months when about 60 percent of the seasonal snowpack accumulates.

If the precipitation pattern does not improve, water shortages varying from moderate to severe can be anticipated.

MAP OF SNOW SURVEY SITES

A map of Montana Snow Survey Sites is included in this Water Supply Outlook Report. Please keep this copy because future issues this season will not include a map.

A few extra copies are available from the Snow Survey office. If needed, additional copies may be requested from:

Soil Conservation Service
Snow Survey Supervisor
P. O. Box 98
Bozeman, MT 59715

SNOW SURVEY DATA

SNOW January 1981

DRAINAGE BASIN and/or SNOW COURSE	Elevation	Date of Survey	THIS YEAR		PAST RECORD	
			Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Average
NAME					Last Year	
ARCH FALLS	7350	12/30	7	1.9	4.0	5.9
BADGER PASS	6900	1/01	47	15.5A	16.0A	21.2
BADGER PASS PILLOW	6900	1/01	SP	12.9	13.6	-
BANFIELD MOUNTAIN	5600	1/02	27	9.8	6.9	11.6
BANFIELD MOUNTAIN PILLOW	5600	1/02	SP	9.2	7.1	9.7
BARKER LAKES	8250	12/30	22	7.0	-	-
BARKER LAKES PILLOW	8250	12/30	SP	7.7	4.0	-
BASIN CREEK	7180	1/05	14	3.7	1.0	-
BASIN CREEK PILLOW	7180	1/05	SP	3.9	1.6	-
BEAGLE SPRINGS PILLOW	8850	1/01	SP	1.9	2.5	-
BEAR PAW SKI AREA	5200	12/30	0	.0	1.4	2.6
BIG COULEE	5100	12/22	0	.0	.0	2.9
BIG SKY	7700	12/30	14	3.5	5.0	7.0
BIG SPRINGS (IO)	6500	12/30	23	6.7	3.9	7.8
BLACK BEAR	7950	12/29	44	13.2	10.2	17.3
BLACK BEAR PILLOW	7590	12/29	SP	13.3	9.4	16.4
BLAGK PINE	7100	12/30	11	3.0	2.2	5.2
BLACK PINE PILLOW	7100	12/30	SP	4.7	3.0	6.4
BLOODY DICK PILLOW	7600	1/01	SP	4.9	2.9	-
BLUE LAKE	5900	1/01	28	8.0A	4.5A	10.8
BOULDER MOUNTAIN PILLOW	7950	1/01	SP	4.8	7.2	-
BOX CANYON PILLOW	6670	1/01	SP	1.6	3.2	-
BOXELOCK CREEK	5100	12/30	0	.0	3.4	3.8
BRIDGER BOWL	7250	12/29	16	4.4	4.8	13.1
BRIDGER BOWL PILLOW	7250	12/29	SP	5.7	5.1	12.3
BULL MOUNTAIN	6600	1/02	0	.0	1.0	2.6
CALVERT CREEK PILLOW	6450	1/01	SP	2.0	1.5	6.0
CAMP CREEK (IO)	6800	12/31	13	3.0	2.2	4.8
CANYON (WY)	7750	1/01	21	3.2	3.0	6.5
CARROT BASIN	9000	12/23	42	10.6	11.2	16.6
CARROT BASIN PILLOW	9000	12/23	SP	8.1	9.0	12.2
CASHE CREEK PILLOW	7800	1/01	SP	1.6	-	-
CHESSMAN RESERVOIR	6200	12/30	0	.0	.4	1.4
GLOVER MEADOW PILLOW	8800	1/01	SP	5.3	5.7	-
COLE CREEK	7850	12/31	18	6.0	6.4	8.6
COLE CREEK PILLOW	7850	12/31	SP	5.2	5.6	8.5
COMBINATION	5600	12/30	0	.0	.6	2.5
COMBINATION PILLOW	5600	12/30	SP	.6	1.0	2.8
COPPER BOTTOM PILLOW	5200	1/01	SP	4.2	2.6	7.4
COPPER CAMP PILLOW	6950	1/01	SP	13.1	11.9	19.6
COYOTE HILL	4200	1/02	8	2.6	3.1	4.0
CRYSTAL LAKE PILLOW	6100	1/01	SP	4.5	4.0	-
DAISY PEAK	7600	12/29	17	4.3	2.0	-
DALY CREEK	5780	12/31	10	3.9	3.1	5.2
DALY CREEK PILLOW	5780	12/31	SP	4.5	2.9	-
DARKHORSE LAKE PILLOW	8700	1/01	SP	9.5	-	-
DEADMAN CREEK	6450	12/29	11	2.7	2.6	5.6
DEADMAN CREEK PILLOW	6450	12/29	SP	2.7	2.3	5.2
DESERT MOUNTAIN	5600	1/06	21	6.2	3.4	7.0
DEVILS SLIDE	8100	12/30	19	5.6	6.8	10.5
DISCOVERY BASIN	7050	12/29	15	4.2	2.0	6.0
DIVIOE PILLOW	7800	1/01	SP	2.8	3.0	4.6
DIX HILL	6400	1/01	4	1.6	1.8	5.1
EAST ENTRANCE (WY)	7000	1/01	11	2.8	4.0	4.4

SNOW

January 1981

DRAINAGE BASIN and/or SNOW COURSE	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	PAST RECORD	
					Water Content (Inches)	Average
NAME					Last Year	
MADISON PLATEAU PILLOW	7750	12/29	SP	8.4	6.4	10.1
MANY GLACIER	4960	12/31	30	8.2	7.8	-
MANY GLACIER PILLOW	4960	12/31	SP	9.4	7.1	-
MARIAS PASS	5250	1/01	18	5.9	5.0	6.6
MAYNARD CREEK	6210	12/29	1	.2	1.7	6.4
MAYNARD CREEK PILLOW	6210	12/29	SP	1.6	2.0	5.3
MONUMENT PEAK PILLOW	8800	1/01	SP	7.2	-	-
MOOSE CREEK (ID)	6200	12/31	23	7.4	3.2	6.9
MOULTON RESERVOIR	6850	12/29	0	.0	1.5	-
MOUNT LOCKHART	6400	12/30	22	6.4	7.8	9.7
MOUNT LOCKHART PILLOW	6400	12/30	SP	6.7	4.9	8.6
MULE CREEK PILLOW	8300	1/01	SP	4.7	-	-
NEWTOWN MOUNTAIN	5600	12/30	41	16.2	14.5	-
NEVADA CREEK PILLOW	6480	1/01	SP	4.3	-	-
NEZ PERCE CAMP PILLOW	5580	1/01	SP	4.2	2.4	-
NOISY BASIN	6040	1/06	48	15.8	14.2	18.6
NOISY BASIN PILLOW	6040	1/06	SP	14.9	11.9	17.7
NORRIS BASIN (WY)	7500	12/31	14	3.3	2.0	5.0
NORTH FK. ELK CREEK	6250	1/02	7	1.8	3.0	5.1
NORTH FK. ELK CREEK PILL	6250	1/02	SP	2.6	3.0	5.3
NORTH FORK JOCKO	6330	1/06	44	13.8	14.5	-
NORTHEAST ENTRANCE	7400	1/01	9	1.8	1.9	3.7
NORTHEAST ENTRANCE PILL.	7400	1/01	SP	3.1	2.0	4.3
OLO FAITHFUL (WY)	7360	1/01	18	2.3	2.7	-
OPHIR PARK	7150	1/01	20	6.4	3.0	8.8
PETERSON MEADOWS	7200	12/29	17	5.2	2.0	4.9
PETERSON MEADOWS PILLOW	7200	12/29	SP	5.4	2.1	5.1
PICKFOOT CREEK PILLOW	6650	1/01	SP	1.9	1.2	-
PIKE CREEK PILLOW	5930	1/01	SP	8.7	8.4	-
PIPESTONE PASS	7200	12/30	0	.0	.0	2.4
PLACER BASIN PILLOW	8830	1/01	SP	5.2	-	-
POORMAN CREEK	5100	1/02	22	8.4	10.4	15.9
POORMAN CREEK PILLOW	5100	1/02	SP	7.8	8.7	12.9
PORCUPINE PILLOW	6500	1/01	SP	1.2	.8	-
REO TOP	5260	12/30	37	12.4	9.2	-
ROCKER PEAK	8000	1/02	23	6.8	3.1	7.9
ROCKER PEAK PILLOW	8000	1/02	SP	7.4	3.2	7.3
ROCKY BOY	4700	12/30	0	.0	.0	1.7
ROCKY BOY PILLOW	4700	12/30	SP	.0	1.3	1.8
SADDLE MOUNTAIN	7940	12/29	41	11.8	6.4	11.1
SADOLE MOUNTAIN PILLOW	7940	12/29	SP	11.1	7.1	12.3
SAVAGE PASS (IO)	6600	12/30	28	9.6	7.7	10.2
SAWTELL MOUNTAIN (IO)	8710	12/30	39	11.8	10.6	14.1
SHOWER FALLS	8100	12/30	21	6.1	7.5	11.9
SHOWER FALLS PILLOW	8100	12/30	SP	7.6	7.5	11.8
SKALKAHU SUMMIT	7260	12/29	34	9.6	6.6	-
SKALKAHU SUMMIT PILLOW	7260	12/29	SP	9.4	6.7	-
SKYLARK TRAIL PILLOW	6200	1/01	SP	7.0	-	-
SPOTTEO BEAR MOUNTAIN	7000	1/01	11	3.3	3.8	6.9
SPUR PARK	8000	12/29	31	8.7	4.8	9.8
SPUR PARK PILLOW	8100	12/29	SP	9.9	6.0	10.7
STAHL PEAK	6050	1/02	52	18.2	16.7	23.4
STAHL PEAK PILLOW	6050	1/02	SP	16.1	15.0	18.2
STORM LAKE	7780	12/29	20	5.8	2.2	5.6
STUART MOUNTAIN	7400	1/06	37	11.4	11.5	13.4
SUCKER CREEK	3960	12/30	0	.0	.0	.3
SYLVAN PASS (WY)	7100	1/01	15	3.4	3.8	5.9
TARGHEE PASS (ID)	7000	12/30	15	3.7	2.7	6.2

SNOW January 1981

DRAINAGE BASIN and/or SNOW COURSE	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	PAST RECORD	
					Water Content (Inches)	Average
NAME					Last Year	
EMERY CREEK	4350	1/06	24	7.4	2.7	7.2
EMERY CREEK PILLOW	4350	1/06	SP	7.1	3.6	-
FISH CREEK	8000	1/05	15	3.6	1.0	-
FISHER CREEK	9100	1/01	EST	13.5	11.0	17.7
FISHER CREEK PILLOW	9100	1/01	SP	13.0	10.7	16.4
FLATTOP MOUNTAIN PILLOW	6300	1/01	SP	23.7	18.1	22.2
FLEECER RIOGE	7500	1/02	13	3.4	1.8	5.1
FOURTH OF JULY	3450	12/30	9	2.8	1.9	-
FRIOAY HILL	4620	12/30	27	8.8	6.2	-
FROHNER MEADOWS	6480	12/30	1	.2	1.7	4.1
FROHNER MEADOWS PILLOW	6480	12/30	SP	2.6	2.4	4.3
GARVER CREEK	4250	1/02	18	5.5	2.9	5.9
GARVER CREEK PILLOW	4250	1/02	SP	6.2	5.1	5.0
GIBBONS PASS	7100	12/29	35	10.5	5.8	9.1
GRAVE CREEK	4300	1/02	18	5.7	3.8	9.0
GRAVE CREEK PILLOW	4300	1/02	SP	6.7	5.6	8.8
GRIZZLY PEAK	8400	12/31	14	4.7	6.1	8.2
HAND CREEK	5030	12/30	14	2.8	3.9	-
HAND CREEK PILLOW	5030	1/01	SP	3.9	4.8	-
HAWKINS LAKE	6450	1/02	39	14.3	13.2	14.6
HAWKINS LAKE PILLOW	6450	1/02	SP	13.5	11.0	14.1
HEART LAKE TRAIL	4800	1/01	9	3.1	6.3	6.6
HEBGEN OAM	6550	12/29	18	4.1	2.6	5.0
HELL ROARING OVIDE	5770	12/31	39	11.0	9.4	14.5
HIGHWOOD DIVIOE	5650	12/22	0	.0	.0	4.8
HIGHWOOD STATION	4600	12/22	0	.0	.0	2.3
HOLBROOK	4530	1/01	3	1.0A	2.5A	4.2
HOOO MEADOW	6600	12/30	4	1.1	3.6	5.5
HOOOOO BASIN	6000	1/06	48	16.0	18.8	22.3
HOOOOO BASIN PILLOW	6000	1/01	SP	14.3	15.9	20.6
HOOOOO CREEK	5900	1/06	42	15.2	14.8	18.8
ISLAND PARK (IO)	6310	12/30	22	6.1	4.0	6.2
JOHNSON PARK	6450	12/29	6	1.4	.6	-
KILGORE (IO)	6200	12/31	17	4.0	2.6	4.5
KINGS HILL	7500	12/29	20	5.4	3.2	7.5
KIWANIS CAMP	3720	12/30	0	.0	.0	.8
KRAFT CREEK PILLOW	4750	1/01	SP	1.9	-	-
LAKE CAMP (WY)	7850	1/02	11	2.4	1.5	3.6
LAKEVIEW CANYON	6930	12/30	17	5.2	2.9	5.4
LAKEVIEW RIOGE	7400	12/30	15	3.7	2.2	5.0
LAKEVIEW RIOGE PILLOW	7400	12/30	SP	6.0	1.9	-
LEMHI RIOGE PILLOW	8100	1/01	SP	2.3	2.4	4.9
LICK CREEK	6860	12/30	6	2.1	3.9	4.3
LICK CREEK PILLOW	6860	12/30	SP	3.3	3.0	4.4
LOLO PASS (IO)	5230	12/30	21	6.7	8.8	11.5
LONE MOUNTAIN	8800	12/30	26	6.1	7.8	10.5
LOOKOUT (IO)	5250	1/02	25	8.0	10.4	13.7
LOST HORSE	5940	12/30	24	9.7	8.2	13.8
LOWER TWIN PILLOW	7900	1/01	SP	9.2	-	-
LUBRECHT FLUME	4200	12/31	0	.0	1.1	2.4
LUBRECHT FLUME PILLOW	5450	12/31	SP	.2	1.0	2.2
LUBRECHT FOREST # 3	5450	12/30	2	.6	1.1	2.9
LUBRECHT FOREST # 4	4650	12/30	0	.0	.7	1.5
LUBRECHT FOREST # 6	4040	12/31	0	.0	.6	1.5
LUBRECHT HYDROPLLOT	4200	12/31	1	.4	.8	2.8
LUPINE CREEK (WY)	7300	12/31	11	2.0	2.5	4.8
MAISON PLATEAU	7750	12/29	26	7.4	5.3	9.6

SNOW

January 1981

DRAINAGE BASIN and/or SNOW COURSE		PAST RECORD				
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
					Last Year	Average
TAYLOR ROAD	4080	12/30	0	.0	.0	1.9
TEN MILE LOWER	6600	12/30	5	1.7	1.6	2.8
TEN MILE MIDDLE	6800	12/30	17	5.0	2.7	4.6
TEN MILE UPPER	8000	12/30	22	7.0	2.6	5.6
TEPEE CREEK	8000	1/01	EST	4.2	4.4	6.6
TEPEE CREEK PILLOW	8000	1/01	SP	3.5	4.2	6.3
THUMB DIVIOE (WY)	7900	12/29	24	6.0	3.8	8.6
TOGWOTEE PASS (WY)	9600	12/30	41	10.7	7.5	13.4
TRINKUS LAKE	6100	1/01	34	13.0	12.4	-
TV MOUNTAIN	6800	1/06	18	5.1	5.9	7.4
TWELVENILE CREEK	5600	12/30	12	4.6	5.6	8.4
TWELVENILE CREEK PILLOW	5600	12/30	SP	3.8	4.5	7.4
TWENTY-ONE MILE	7150	12/31	24	5.9	3.6	7.8
TWIN CREEKS	3580	1/01	4	1.0A	2.0A	5.2
TWIN LAKES	6510	12/30	38	12.9	12.5	17.9
TWIN LAKES PILLOW	6400	12/30	SP	12.0	11.9	17.9
UPPER HOLLAND LAKE	6200	1/06	36	11.0	10.8	-
VALLEY VIEW (IO)	6500	12/30	17	4.5	2.8	6.4
WALDRON	5600	12/30	0	.0	2.1	3.7
WALORON PILLOW	5600	12/30	SP	2.6	3.4	4.8
WARM SPRINGS	8250	12/31	26	7.7	4.7	--
WARM SPRINGS PILLOW	8250	12/31	SP	8.7	4.8	-
WEASEL OIVIOE	5450	1/02	43	16.1	13.0	-
WEST YELLOWSTONE	6700	12/31	12	2.4	2.6	5.1
WEST YELLOWSTONE PILLOW	6700	12/31	SP	2.6	1.9	4.1
WHISKEY CREEK	6800	12/29	23	5.5	4.0	8.6
WHISKEY CREEK PILLOW	6800	12/29	SP	5.5	3.9	7.7
WHITE ELEPHANT (ID)	7700	12/30	31	8.0	6.3	8.9
WHITE MILL	8700	1/01	EST	9.5	7.0	13.8
WHITE MILL PILLOW	8700	1/01	SP	8.0	5.1	12.1
WILLOW CREEK	6500	12/31	0	.0	3.0	3.9
WOOD CREEK PILLOW	5960	1/01	SP	1.9	3.4	-

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD	
	FORECAST		THOUSAND ACRE FEET		FORECAST		THOUSAND ACRE FEET		FORECAST		THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average
PERIOD	APRIL - SEPTEMBER				APRIL - JULY				APRIL - JUNE			
KOOTENAI RIVER below Libby Dam.....	8,330	115	6,221	7,246	7,100	115	5,429	6,178			4,707	
FISNER RIVER near Libby.....	195	72		240	180	71		253				
YAAK RIVER near Troy.....	490	91		537	464	90		514				
KOOTENAI RIVER at Leona (1).....	9,590	108	7,670	8,883	8,350	108	6,771	7,727			5,944	6,150
INFLOW MOULTON RESERVOIR nr BUTTE (Million Callona)....					203	71	387	286	190	73	345	260
WARM SPRINGS CREEK AT MEYERS OAM near Anaconda (2)....	43.0	85	29.6	50.7	35.5	86	23.5	41.2				
FLINT CREEK near Southern Croaa (3).....	15.1	82	24.8	18.5	12.8	83	20.3	15.4				
FLINT CREEK below Boulder Creek (4).....	63.5	82		77.6	50.2	82		61.3				
INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5).....	12.9	76	13.0	16.9	12.0	75	12.2	16.0				
MIDDLE FORK ROCK CREEK near Philipaburg.....	66.5	84		78.8	60.0	84		71.1				
NEVADA CREEK nr Finn.....	16.5	70		23.6	15.6	72		21.8				
BLACKFOOT RIVER near Bonner.....	830	82		1,017	740	80		920	630	79		794
CLARK FORK RIVER above Milltown (6).....	750	89		843	655	90		730	550	90		613
CLARK FORK RIVER above Miasaoula.....	1,580	85	1,929	1,859	1,395	84	1,730	1,651	1,180	84	1,474	1,408
WEST FORK BITTERROOT RIVER near Conner (7).....	143	76		187	132	77		172				
BITTERROOT RIVER near Darby.....	485	81		602	450	82		552	400	83		480
SKALKAHO CREEK near Hamilton.....	47.1	82		57.4	41.5	83		49.8				
BURNT FORK CREEK near Stevensville.....	31.7	82		38.8	27.5	82		33.6				
BITTERROOT RIVER at Miasaoula (9).....	1,220	79		1,543	1,130	80		1,416	980	81		1,211
CLARK FORK RIVER below Miasaoula.....	2,800	82		3,405	2,525	82		3,069	2,160	82		2,618
CLARK FORK RIVER at St. Regia.....	3,760	83	4,348	4,521	3,400	83	3,938	4,078	2,900	83	3,418	3,492
NORTH FORK FLATHEAD RIVER near Columbia Falla.....	1,830	93		1,969	1,650	93		1,782	1,380	92		1,498
MIDDLE FORK FLATHEAD RIVER near West Glacier.....	1,730	91	1,747	1,911	1,600	91	1,576	1,750	1,330	90	1,412	1,470
SOUTH FORK FLATHEAD RIVER near Columbia Falla.....	2,000	87	1,946	2,302	1,880	87	1,808	2,159	1,620	86	1,652	1,884
FLATHEAD RIVER at Columbia Falla (10).....	5,590	88	5,391	6,330	5,180	89	4,903	5,827	4,400	89	4,443	4,064
SWAN RIVER near Big Fork.....	595	87		681	528	89		596				
FLATHEAD RIVER near Polson (11).....	6,520	88	6,382	7,394	6,060	89	5,787	6,806	5,150	89	5,159	5,779
CLARK FORK RIVER near Flaina (11).....	10,600	86	11,550	12,340	9,640	86	10,462	11,222	8,170	86	9,163	9,507
THOMPSON RIVER near Thompson Falla.....	207	79		263	183	78		234				
PROSPECT CREEK at Thompson Falla.....	110	77		143	100	75		133				
CLARK FORK RIVER at Whitehorse Rapids.....	11,600	84		13,781	10,500	84		12,519	8,930	84		10,633

- Adjusted for storage in Lake Koocanusa.
- Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
- Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
- Sum Flint Creek at Maxville and Boulder Creek at Maxville.
- Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
- Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.
- Adjusted for storage in Pointed Rocks Reservoir.
- Adjusted for diversion into Sunset Highline Canal.
- Difference in observed flow Clark Fork above and below Miasaoula.
- Adjusted for storage in Hungry Horse Reservoir.
- Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
- Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-BASIN	Number of Gauges Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average
Kootenai/BC.....	-	-	-
Kootenai/Montana.....	6	116	77
Kootenai.....	-	-	-
Little Bitterroot.....	-	-	-
Flathead.....	11	114	76
Clark Fork above Blackfoot.....	17	164	65
Blackfoot.....	11	103	50
Clark Fork above Miasaoula.....	28	135	59
Bitterroot.....	9	123	80
Lower Clark Fork below Miasaoula.....	3	84	61
Clark Fork (Total w/o Flathead)....	40	119	66
Pend O'Reille (Clark Fork & Flathead).....	51	117	69
Columbia (Pend O'Reille & Kootenai).....	48	115	68

STREAMFLOW FORECASTS

Spring and summer runoff is forecast to be 10 to 25 percent less than average in most drainages. Streama with low elevation headwaters are forecast to produce a much less than average amount of water during spring runoff.

Near average runoff is predicted for the Kootenai River where snowfall and precipitation have been near to above average.

Soil moisture under the snowpack is generally average to above average.

If mountain snowfall remains below average, some water shortages can be expected during spring and summer months.

MOUNTAIN SNOWPACK

The snowpack varies from much below average in the lower portion of the Bitterroot, Clark Fork, Blackfoot and Flathead River drainages to near average in the Yaak River drainage and along some sections of the Continental Divide.

Low elevation snowpack has been depleted in many areas due to abnormally warm temperatures last month. Rainfall occurred in many areas in December with much of it being absorbed by the soil. Some flooding was reported in lower elevations in the Kootenai River drainage where rainfall and snowmelt were too great to be absorbed by the saturated soils.

SATELLITE SNOW COVER

DATE	PERCENT SNOW COVER	AVERAGE SNOWLINE ELEVATION IN FEET
November 5, 1980	8	8670
November 16, 1980	94	4450
November 23, 1980	78	5440
November 26, 1980	75E	5590
December 1, 1980	100	3850
December 7, 1980	87	4950
December 13, 1980	55E	6450
December 28, 1980	41	6980
December 31, 1980	31	7370

DATA PROVIDED BY NOAA/NESS

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH December 31, 1980

December 31, 1966

Basin or Stream	RESERVOIR	Useable Capacity	Useable Storage		
			This Year	Last Year	Average
COLUMBIA					
Kootenai	Koocanusa	5,694.0	3,704.0	2,881.0	--
Flathead	Hungry Horse	3,428.0	2,833.0	2,055.0	2,624.0
	Flathead Lake	1,791.0	1,408.0	1,122.0	1,428.0
	Camas (4)	45.2	22.8	15.2	19.4
	Mission Valley (8)	100.3	26.2	25.0	34.4
Clark Fork	Georgetown Lake	31.0	30.0	28.1	28.2
	Lower Willow Creek	4.9	1.6	1.0	1.4
	Nevada Creek	12.6	5.8	3.0	4.3
	Noxon Rapida	334.6	308.2	326.9	318.2
MISSOURI					
Beaverhead	Lima	84.0	18.1	11.4	38.8
	Clark Canyon	257.2	161.1	137.2	132.7
Ruby	Ruby	38.8	--	--	20.4
Madison	Hcbgen Lake	377.5	274.7	277.0	241.5
	Ennis Lake	41.0	30.0	34.7	35.6
Callatin	Middle Creek	8.0	3.5	2.8	2.9
Missouri	Canyon Ferry	2,043.0	1,817.0	1,652.0	1,753.0
	Hauser & Helena	61.9	63.0	63.7	61.2
	Lake Helena	10.4	10.9	11.1	10.2
	Nolter Lake	81.9	81.0	81.6	76.2
	Fort Peck Lake	18,910.0	15,380.0	16,470.0	15,820.0
Smith	Smith River	10.6	5.3	6.2	6.4
	Newlan Creek	12.4	--	8.6	--
Musselshell	Bair	7.0	4.5	4.7	4.2
	Martinsdale	23.1	10.5	10.6	10.0
	Deadman's Basin	72.2	--	--	44.7
Sun	Gibson	99.0	47.6	26.8	38.6
	Willow Creek	32.2	18.9	23.2	20.6
Marias	Pishkun	32.0	19.6	18.9	16.7
	Swift	30.0	16.2	10.8	12.9
	Lake Frances	111.9	78.6	62.8	70.9
Milk	Elwell (Tiber)	1,347.0	541.2	544.6	545.6
	Beaver Creek	3.5	1.3	2.6	1.4
	Fresno	127.2	36.8	47.4	68.2
	Nelson	66.8	23.7	43.6	45.0
NUDSON BAY					
St. Mary's	Lake Sherburne	66.2	30.3	15.1	17.0
YELLOWSTONE					
Stillwater	Mystic Lake	21.0	8.6	12.8	13.1
Clark's Fork	Cooney	27.4	12.3	13.9	14.2
Tongue	Tongue River	68.0	10.2	13.9	30.4
Bighorn	Bighorn Lake	1,356.0	949.5	1,001.0	580.3

Average based on 1963-77 period.

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